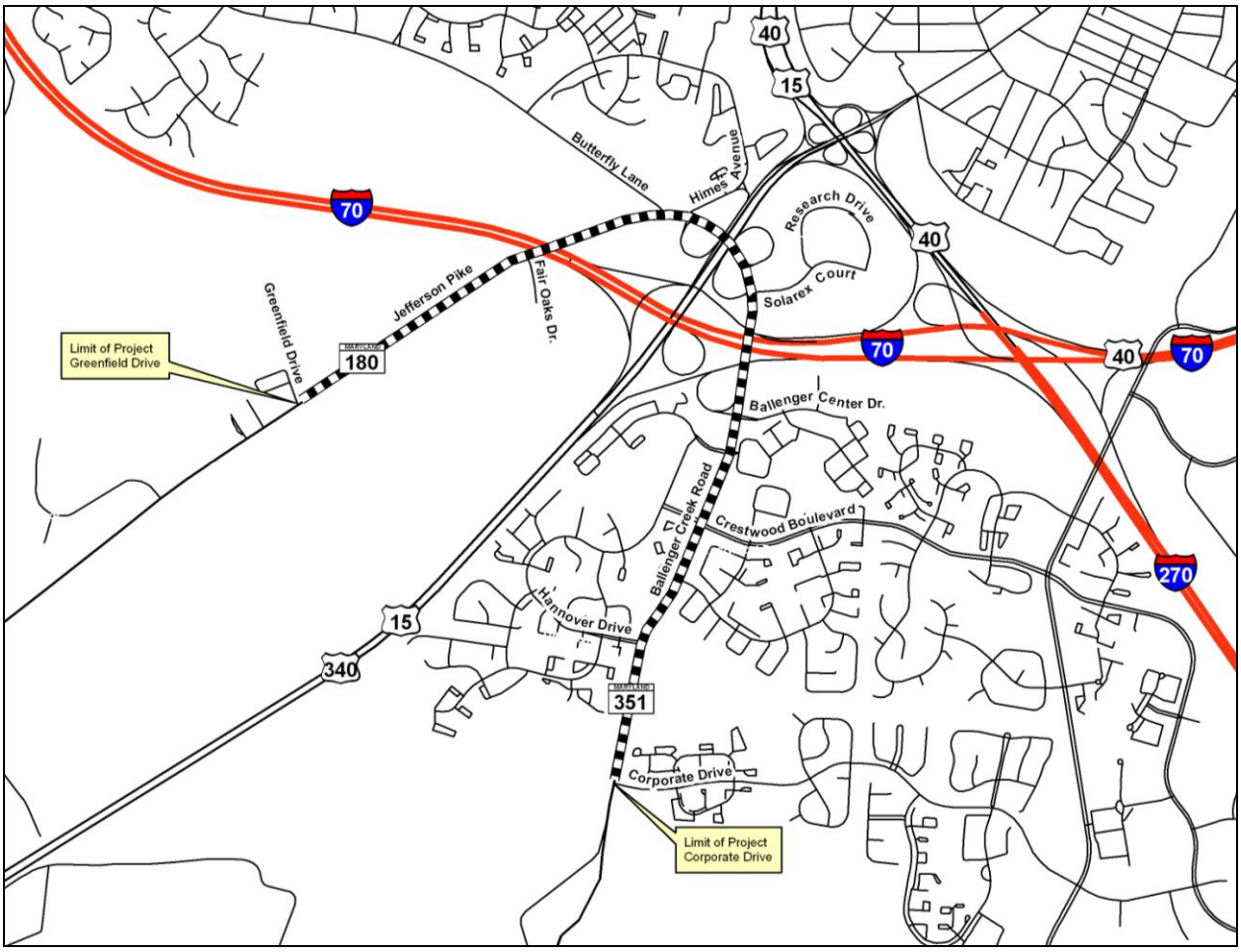
MD 180/MD 351
PROJECT PLANNING STUDY
Frederick County, Maryland

Alternatives Retained For Detailed Study
Project No. FR549M11



December 2007

Maryland Department of Transportation
State Highway Administration

US Department of Transportation
Federal Highway Administration

Introduction

Purpose of the ARDS Summary

The purpose of this report is to update the agencies on scoping activities and the recommendation of the Alternatives Retained for Detailed Study (ARDS). The study team recommends that this project be removed from the streamlined process due to the limited number of impacts that are anticipated to occur to resources within the project limits and study area.

Purpose of the Project

The purpose of this project is to provide additional capacity and improve traffic along MD 180 and MD 351 from Greenfield Drive to Corporate Drive, while supporting existing and planned development.

Background

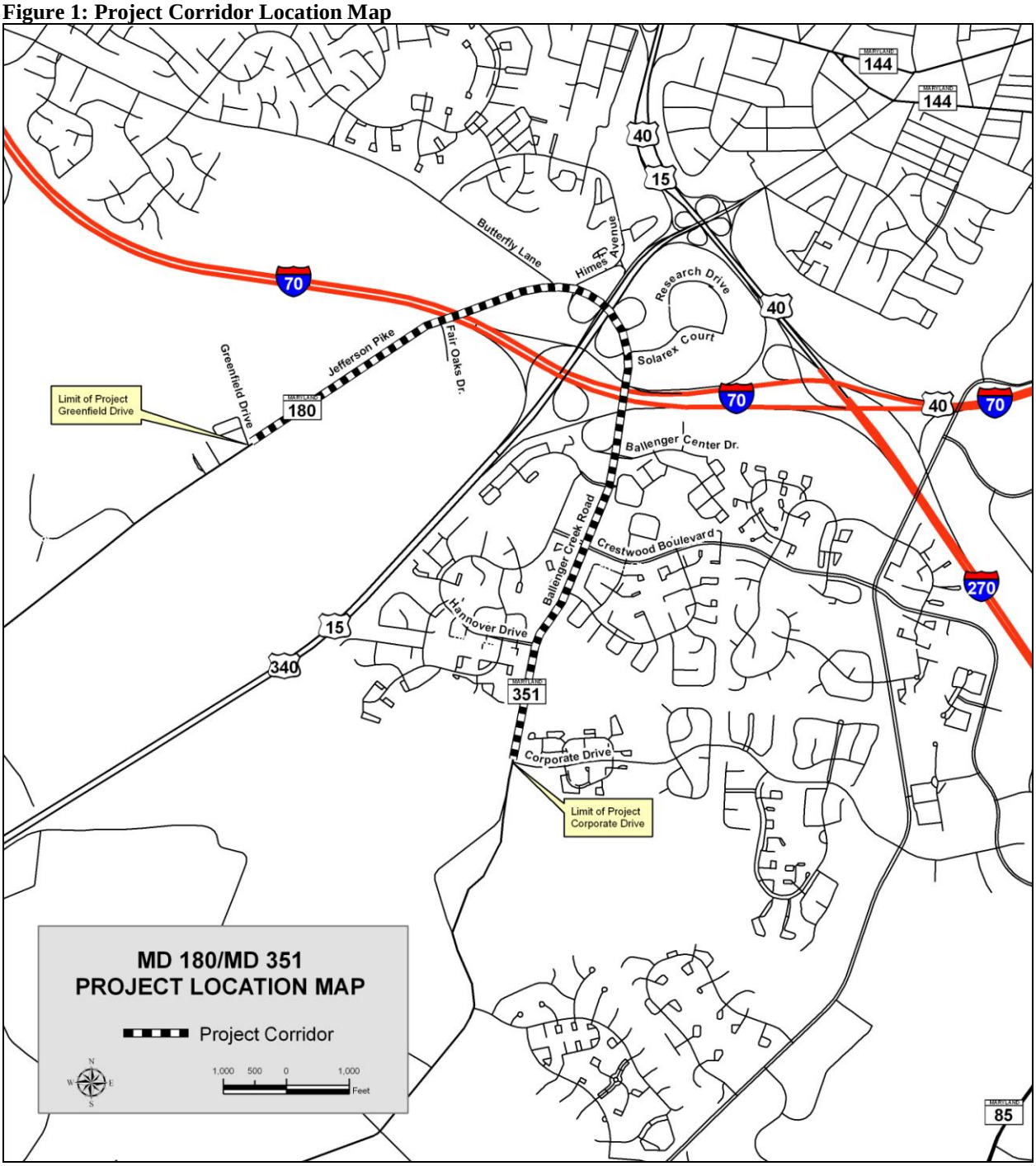
This project is located partially in the City of Frederick and partially in Frederick County, Maryland. See **Figure 1**, the **Project Corridor Location Map** on the next page. The project corridor extends along MD 180 and MD 351 for a distance of 2.7 miles, beginning at the intersection of MD 180 with Greenfield Drive, continuing through the junction of MD 180 with MD 351 at the US 15/US 340 interchange, and ending at the intersection of MD 351 with Corporate Drive.

The MD 180/MD 351 project corridor includes several private driveway entrances and twelve at-grade intersections, five of which are signalized. The project limits also include grade-separated interchanges at US 15/US 340 and I-70. US 15/US 340 runs parallel to MD 180, both routes extending southwest from Frederick toward Brunswick. I-70 is the primary east-west corridor connecting Frederick with Baltimore to the east and with Hagerstown to the west. Both MD 180 and MD 351 within the project corridor are categorized as uncontrolled urban collectors, with the exception of the US 15/US 340 and I-70 interchanges.

Currently, MD 180 consists of one lane northbound and one lane southbound, each lane being twelve feet in width and having shoulders up to nine feet in width.

MD 351, between Solarex Court and Hannover Drive, consists of three twelve-foot through lanes (one southbound and two northbound), with auxiliary/turn lanes provided at intersections. In addition, the southbound lane between Solarex Court and Ballenger Center Drive has an outside shoulder that is up to seven feet wide. Between Hannover Drive and Corporate Drive, MD 351 consists of one twelve-foot through lane in each direction. Each through lane also has a non-continuous right turn auxiliary lane and a variable-width shoulder. The overall width of this portion of roadway, including the auxiliary/right-turn lanes and shoulders, is approximately forty-eight feet.

Figure 1: Project Corridor Location Map



Need for the Project

The growth of numerous businesses and residential properties has steadily progressed within the vicinity of MD 180/MD 351, yielding high traffic volumes and congestion, especially during the peak periods. Currently planned developments will contribute additional traffic, which will exacerbate the existing levels of congestion. Improvements are needed to address existing traffic

congestion and projected operational and safety deficiencies resulting from planned development in and around the study area.

County Master Plan Consistency

The project is consistent with Frederick County's 2002 *Frederick Region Plan*. Existing land use along the MD 180 roadway portion of the project is primarily agricultural, with limited industrial and residential uses. In contrast, the MD 351 roadway segment is highly urbanized, consisting of a mixture of residential and commercial developments, including several business/industrial parks. The project lies within a Frederick County Priority Funding Area, and the 2002 *Frederick Region Plan* indicates that this is an area that has been designated for considerable planned growth.

Planned land use along both roadways consists largely of mixed residential and commercial development, including several planned and approved residential/commercial developments within the project area. There are over 300 acres designated for residential and commercial development in the study area. The population and employment are projected to increase 73% and 88%, respectively, by the year 2030, as compared to the year 2000.

The *Frederick County Master Transportation Plan* of December 2001 specifically lists MD 180 from I-70 to Solarex Court and MD 351 from Solarex Court to I-70 as a Maryland State Highway Administration (SHA) long-term project within the county. Furthermore, the Frederick County Board of County Commissioners considered this project to be a top transportation planning priority for 2007.

The *City of Frederick Maryland Comprehensive Plan of 2004* does not specifically mention this project, but it does advocate the need for transportation improvements in this general area, specifically mentioning the need to develop a southwest loop connection that would extend from Mount Phillip Road eastward to MD 180.

Next Steps

The following steps are required to complete the Project Planning Process. The expected time of completion for each step is shown in parentheses.

- Evaluate and address public and agency comments resulting from the studies to date and from the Alternates Public Workshop (Fall 2007).
- Identify alternatives for detailed study and complete detailed engineering and environmental studies (Spring 2008).
- Complete draft environmental document and hold Location/Design Public Hearing (Fall/Winter 2008).
- Identify the SHA Preferred Alternative and Conceptual Mitigation (Spring 2009).
- Complete final environmental document and receive Location/Design Approval if a build alternative is selected (Fall/Winter 2009).

Alternatives Scoping

Details about each alternative are provided below. **Figures 2 through 5** at the end of this section show the typical sections for each alternative. Also see the alternatives mapping in **Appendix A** of this document for maps illustrating the pertinent areas and proposed road conditions that would occur under each alternative.

Initial Alternatives Identified

Three alternatives were originally identified for consideration. The alternatives included:

- Alternative 1: No-Build
- Alternative 2: TSM/TDM[1]
- Alternative 3: Four-Lane Divided that includes three options

Alternative 1 – No-Build

The No-Build Alternative serves as a baseline for comparing the impacts and benefits associated with the build alternatives. With the exceptions of signal-control devices to be installed at three intersections and certain developer-required improvements currently planned for the area, only normal maintenance and spot improvements would be implemented.

The three intersections at which signal-control devices are to be installed are:

- MD 180 at the off-ramp from northbound US 15/US 340
- MD 351 at Hannover Drive
- MD 351 at Corporate Drive

The improvements required to be provided by local developers include:

- Widening MD 180 from Himes Avenue to Solarex Court by adding two through lanes in both directions, except for the bridge over US 15/US 340.
- Re-striping southbound MD 180 with a shared through/right-turn lane and a right-turn lane at Butterfly Lane. A new right-turn lane will be provided on southbound Butterfly Lane, and an additional receiving lane will be provided on northbound Butterfly Lane.
- Widening the southbound US 15/US 340 off-ramp with a new left-turn lane. A new right-turn lane will be provided on southbound MD 180, and an additional receiving lane will be provided on northbound MD 180.
- Widening Solarex Court with a new right-turn lane. New double-left-turn lanes on northbound MD 180 and an additional receiving lane on the northbound US 15/US 340 on-ramp will be added. A new single-left-turn lane on southbound MD 180 is also proposed.

Alternative 2 – TSM/TDM

Alternative 2 addresses capacity concerns at intersections throughout the study area. In addition to the No-Build improvements, Alternative 2 also includes geometric and signal-timing

[1] Transportation System Management/Transportation Demand Management

improvements at key intersections and sections of MD 180/MD 351. These improvements include:

- A new left-turn lane on southbound MD 180 and a new right-turn lane on northbound MD 180 at Fair Oaks Drive.
- Two through lanes at both approaches of MD 180 at Butterfly Lane and a left-turn lane at northbound MD 180.
- Widening the northbound US 15/US 340 off-ramp with double-left-turn lanes and a right-turn lane. Widening the bridge over US 15/US 340 to match developer improvements on either side.
- Two through lanes in both directions along the corridor from Solarex Court to Crestwood Boulevard, proposed double-left-turn lanes on both approaches of MD 180 at Solarex Court, and a median under the I-70 bridges. Reconstruction of the I-70 bridges will be needed. Other improvements include an auxiliary lane in each direction between Ballenger Center Drive and Crestwood Boulevard, and left-turn lanes at both approaches of MD 351 at Ballenger Center Drive and the southbound approach at Crestwood Boulevard.
- A left-turn lane, a through lane, and a through/right-turn shared lane on both approaches of MD 351 at Hannover Drive.
- A left-turn lane, a through lane, and a through/right-turn shared lane at the southbound approach of MD 351 at Corporate Drive; and a left-turn lane, a through lane and a right-turn lane at the northbound approach.
- Signal timing improvements along the corridor.

Alternative 3 – Four-Lane Divided

Alternative 3 improves the roadway capacity throughout the study area and includes the following improvements:

- Widening MD 180 / MD 351 to a four-lane divided roadway from 2000 feet south of Fair Oaks Avenue to Corporate Drive with two through lanes in each direction and a 20-foot median
- Additional turning lanes at intersections and median openings
- Bicycle-compatible outside lanes within the study area, sidewalks along both sides of the roadway except along the south side between the I-70 on-ramp and the US 15/US 340 off-ramp

Three options that are also being considered to augment the improvements proposed for Alternative 3 – Four-Lane Divided are as follows:

Alternative 3 – MD 351 Five-Lane-Section Option

This option involves widening MD 351 from Crestwood Boulevard to Corporate Drive to a five-lane roadway with two through lanes in both directions and a 13-foot center turn lane. This is being proposed to accommodate numerous residential driveways and commercial entrances in this portion of the roadway.

Alternative 3 – US 340 Interchange Option A

In order to accommodate heavy traffic volume from/to US 15/US 340, the four-lane divided roadway would be widened with two additional southbound auxiliary lanes and one northbound auxiliary lane between Himes Avenue and the northbound US 15/US 340 off-ramp. The three loop ramps at this interchange would also be widened to allow US 15/US 340 traffic to enter or exit the project corridor. An auxiliary lane would be provided along northbound US 15/US 340 under this interchange and would tie into the I-70 exit ramp. The auxiliary lane along the collector-distributor road receiving traffic from the southbound US 15/US340 on-ramp would be carried through the interchange.

Alternative 3 – US 340 Interchange Option B

This option combines the improvements of Alternative 3 – US 15/US 340 Interchange Option A with the removal of two loop ramps and the construction of new ramps to form a half-diamond interchange on the northbound side of US 15/US 340.

Alternatives Presented at the Alternates Public Workshop

All three alternatives and all three of the options being considered for Alternative 3 were presented at the Alternates Public Workshop held at the Ballenger Creek Middle School on October 17, 2007.

Public Feedback Obtained During the Alternates Public Workshop

The Alternates Workshop included stations where residents could view the proposed alternatives and ask SHA staff members specific questions about the alternatives presented. A comment card survey was included in the Alternates Workshop brochure that was mailed to the entire study area. Additional comment cards were provided at the meeting. Feedback from the workshop included the following items:

- Based on comments to team members, Alternative 3 Option B seemed to be the most popular option.
- Support was also expressed for the Alternative 3 – 5-lane Section Option.
- Suggestion of a fly-over ramp to northbound US 15 to eliminate the weaving section present there.
- Concerns that the project would ultimately lower property values. SHA representatives at the meeting explained to them that values tend to increase or at least remain the same after an improvement project.
- Concerns commonly expressed by attending residents involved noise, traffic, and dust.

The team also noted that despite having a translator available, no members of the project area's Hispanic population came to the workshop. The team plans to continue outreach efforts to this community throughout the remainder of the study.

Alternatives Retained for Detailed Study (ARDS)

On November 26, 2007 the project team presented its recommendation for ARDS to the SHA Planning Director to obtain his concurrence. The team recommended that the ARDS should include all three initial alternatives and all three of the options that have been considered for initial Alternative 3.

Alternatives Not Retained for Detailed Study

None of the initial alternatives were proposed to be dropped from consideration.

Figure 2: Typical Sections for MD 180 and MD 351 – Existing Conditions

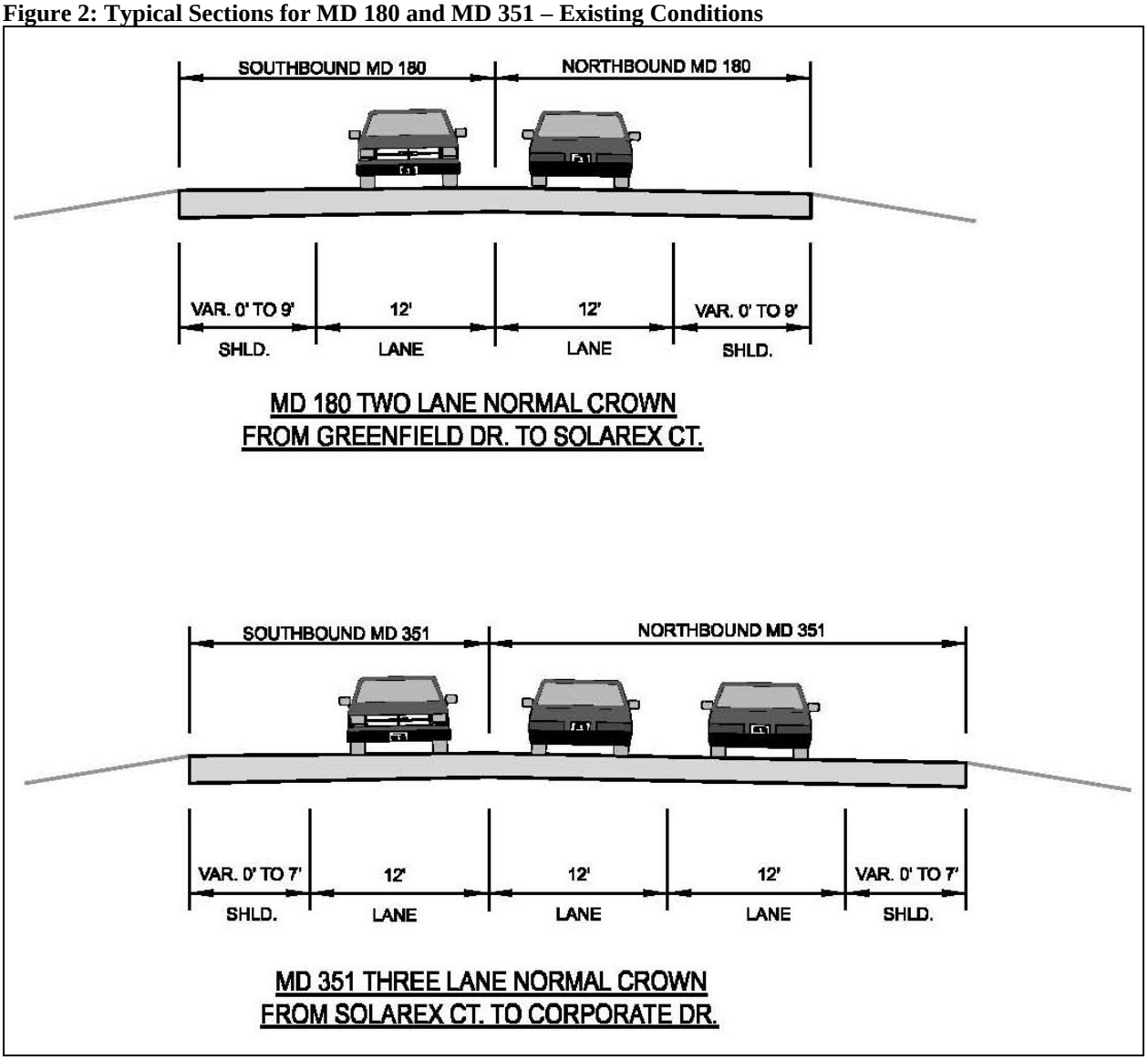


Figure 3: Typical Sections for Alternative 3 – Four-Lane Divided

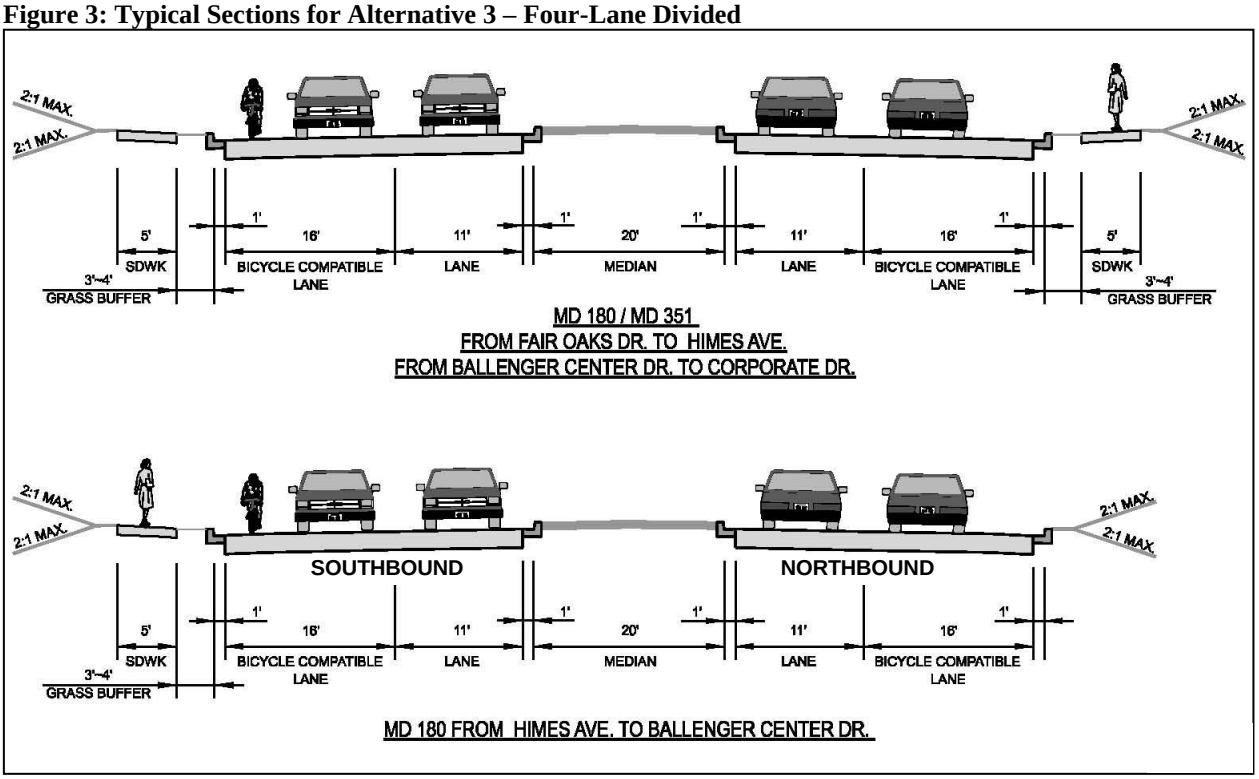


Figure 4: Typical Section for Alternative 3 – MD 351 Five-Lane Section Option

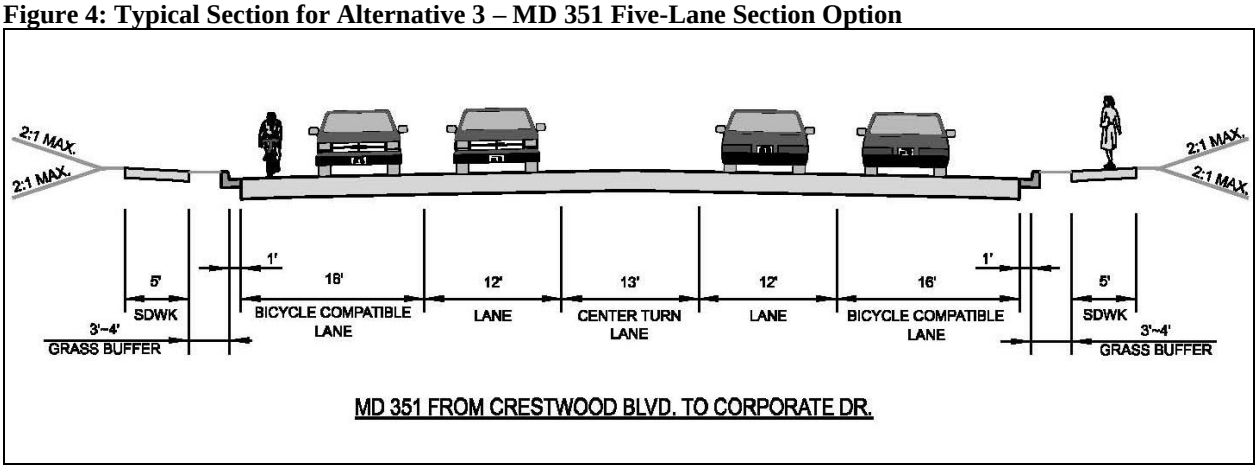
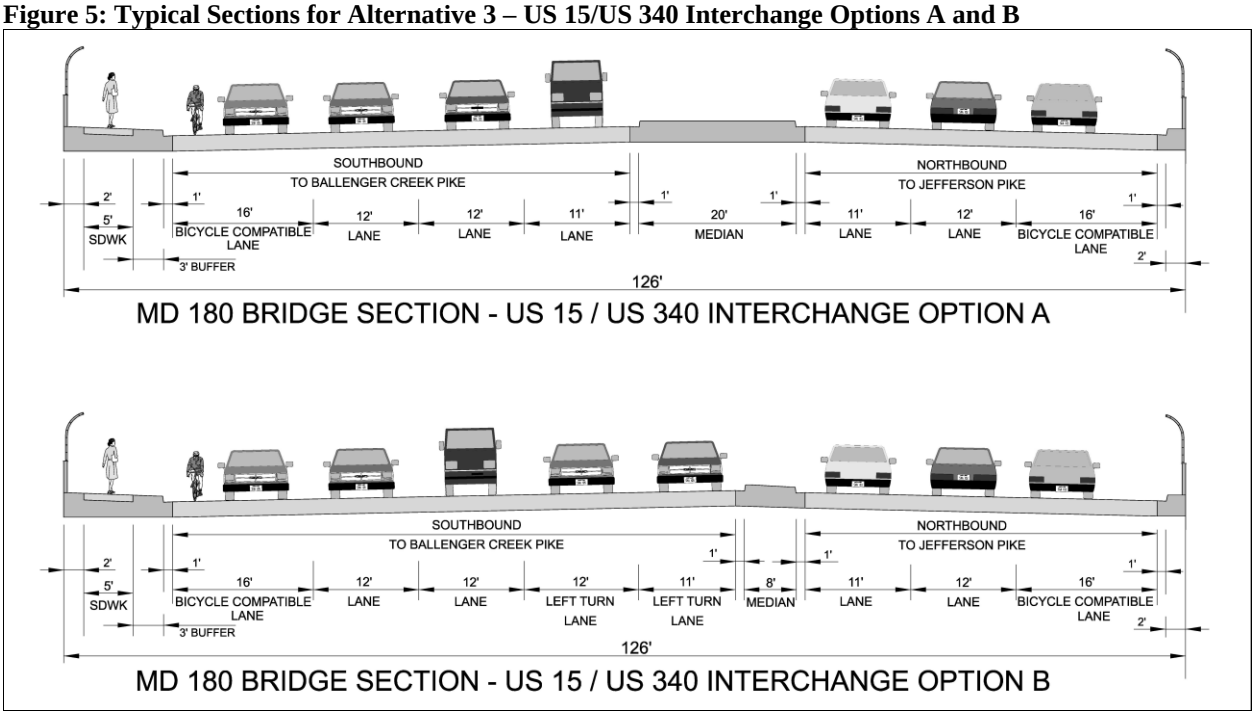


Figure 5: Typical Sections for Alternative 3 – US 15/US 340 Interchange Options A and B



Summary of Traffic Impacts

Level of service (LOS) analyses were performed within the project limits for the 2006 and 2030 no-build and build conditions along MD 180/MD 351. LOS is a measure of the congestion experienced by drivers and ranges from LOS A (free flow, with little or no congestion) to LOS F (failure, with stop-and-go conditions). LOS is normally computed for the peak periods of a typical day, with LOS D (approaching unstable flow) or better generally considered acceptable for intersections or highways in urban and suburban areas. At LOS E, volumes are near or at the capacity of the highway. LOS F represents conditions in which drivers experience operational breakdowns with stop-and-go traffic and extremely long delays at signalized intersections. **Table 1** shows the detailed results of the LOS analyses.

Key points from the LOS analyses are as follows:

- Under 2006 existing conditions seventy percent (seven out of ten) of the signalized intersections operate at LOS C or better during both AM and PM peak hours.
- In 2030 under *Alternative 1 – No-Build* conditions seventy percent (seven of ten) of the intersections are expected to operate at or above capacity (LOS F) during the AM peak hours, and eighty percent are expected to operate at or above LOS F during the PM peak hours.
- In 2030 under *Alternative 2 – TSM/TDM* conditions, forty percent of the intersections are expected to operate at or above LOS F during both the AM and PM peak hours.

- In 2030 under *Alternative 3 – Four-Lane Divided* conditions, thirty percent of the intersections are expected to operate at or above LOS F during both the AM and PM peak hours.
- In 2030 under *Alternative 3 – Five-Lane Section Option* conditions, thirty percent of the intersections are expected to operate at or above LOS F during both the AM and PM peak hours.
- In 2030 under *Alternative 3 – US 340 Interchange Option A* conditions, ten percent of the intersections are expected to operate at or above LOS F during both the AM and PM peak hours.
- In 2030 under *Alternative 3 – US 340 Interchange Option B* conditions, none of the intersections are expected to operate at or above LOS F during either the AM or PM peak hours.

Table 1: 2006 and 2030 MD 180/MD 351 LOS Analyses Results

Intersection	Existing Condition (Year 2006)		Alt. 1 No-Build (Year 2030)		Alt. 2 TSM/TDM (Year 2030)		Alt.3 Four-lane Divided (Year 2030)		Alt.3 Five-lane Section Option (Year 2030)		Alt.3 US 340 Interchange Option A (Year 2030)		Alt.3 US 340 Interchange Option B (Year 2030)	
	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak	AM Peak	PM Peak
MD 180:														
Greenfield Drive	**A**	**A**	**B**	**C**	**A**	**C**	**B**	**D**	**B**	**D**	**B**	**D**	**B**	**D**
Fair Oaks Drive	**A**	**A**	**A**	**D**	**A**	**B**	**A**	**A**	**A**	**A**	**A**	**A**	**A**	**A**
Butterfly Lane	**A**	**B**	**D**	**F**	**D**	**D**	**D**	**E**	**D**	**E**	**B**	**D**	**B**	**D**
Himes Ave. / Ramp from SB US 15/ US 340	**B**	**D**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**C**	**E**	**C**	**E**
Ramp from NB US 15/ US 340	**E**	**C**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**B**	**B**	**C**	**D**
Solarex Drive	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**F**	**E**	**D**
MD 351:														
Ballenger Center Dr./ Ramps to I-70	**B**	**B**	**F**	**F**	**C**	**D**	**C**	**B**	**C**	**B**	**C**	**C**	**D**	**C**
Crestwood Boulevard	**D**	**D**	**F**	**F**	**F**	**F**	**E**	**D**	**E**	**D**	**E**	**D**	**E**	**D**
Hannover Road	**A**	**A**	**F**	**F**	**B**	**D**	**C**	**C**	**C**	**C**	**C**	**C**	**C**	**C**
Corporate Drive	**C**	**B**	**F**	**F**	**F**	**C**	**E**	**B**	**E**	**B**	**E**	**B**	**E**	**B**

Table 2 shows existing and future annual average daily traffic (AADT) within the project limits. In 2006, the AADT ranged from 3,800 to 22,650 along MD 180, and from 8,250 to 24,550 along MD 351. Traffic volumes are forecasted to increase substantially from 2006 to 2030, as residential, employment, and commercial growth occurs in the study area. Under no-build conditions, the AADT for 2030 will range from 18,540 to 42,350 along MD 180, and from 20,000 to 41,115 along MD 351. Under build conditions, the ADT for 2030 will range from 19,580 to 47,570 along MD 180 and from 22,000 to 41,365 along MD 351.

Also shown in **Table 2** are percentage increases in AADT from 2006 to 2030 for both the build and the no-build conditions.

Table 2: MD 180/MD 351 Annual Average Daily Traffic Data

Roadway Segments		2006	2030 No Build	%[1] Increase	2030 Build	%[2] Increase
MD 180	South of Greenfield Drive	3,800	18,540	388	19,580	415
	Between Greenfield Drive and Fair Oaks Drive	3,900	18,620	377	19,680	405
	Between Fair Oaks Drive and Butterfly Lane	3,950	18,720	374	19,760	400
	Between Butterfly Lane and Himes Avenue	12,000	30,720	156	32,260	169
	Between Himes Avenue and Solarex Court	22,650	42,350	87	47,570	110
MD 351	Between Solarex Court and Ballenger Center Drive	24,550	41,115	67	41,365	68
	Between Ballenger Center Drive and Crestwood Boulevard	23,500	32,220	37	34,680	48
	Between Crestwood Boulevard and Hannover Drive	14,100	24,520	74	26,520	88
	Between Hannover Drive and Corporate Drive	12,250	21,020	72	23,020	88
	South of Corporate Drive	8,250	20,000	142	22,000	167

%[1] = percent increase from 2006 to 2030 no-build
%[2] = percent increase from 2006 to 2030 build

Safety

Crash data reveals that the total number of crashes along MD 180 and MD 351 was lower than the 2003-2005 statewide average for crashes along similar roadways. Along the MD 180 portion, a total of 37 crashes occurred in the project area: 14 injury crashes and 23 property-damage crashes. Along MD 351, a total of 43 crashes occurred in the project area: 18 injury crashes and 25 property-damage crashes. Yet, despite their total accident rates being lower than the state average for comparable roads, certain types of accidents were higher in the project area. The MD 180 portion had significantly higher rates of left turn and angle collisions than the statewide average, while the MD 351 portion had slightly higher crash rates for opposite-direction, left-turn, and angle collisions than the statewide average. Left turn and angle collisions typically occur at intersections where there are poor sight distances and where oncoming traffic is traveling at rates above posted speed limits. The high number of access points to driveways and cross streets in the study corridor could also be a contributing factor.

Environmental Impact Summary

An environmental inventory was completed to identify socio-economic, natural, and cultural resources in the study area. A preliminary assessment of impacts to environmental resources resulting from the alternatives under consideration is included in **Table 3**. Impacts to these resources, as well as avoidance, minimization, and mitigation measures, will be further refined as the alternatives are developed in more detail.

Table 3: Summary of Environmental Impacts

	Alternative 1 No-Build	**Alternative 2 TSM/TDM**	**Alternative 3 Four-Lane Divided And Three Options**
Stream Impacts	0 feet	50 feet	415 feet
Wetland Impacts	0 acres	0.42 acre	0.51 acres
Floodplain Impacts	0 acres	0.23 acre	1.1 acres
Public Parks *Ballenger Creek Park*	0 acres	0	1.1 acres
Significant Historic Resources *Prospect Hall*[*] *Maple Homestead Property*[**]	 0 acres 0 acres	 0 acres 0.02 acres	 0.1 acres 0.9 acres
Total Right-of-Way Impact	0 acres	4.6 acres	17.2 acres
Residential Displacements	0	0	1
Business Displacements	0	0	0
Total Cost (Million $)***	0	115 – 125	200 – 250

*****Listed on the National Register of Historic Places
** National Register Eligible
*** 2020 Dollars

Socioeconomic Resources

Depending upon the alternative, between 4.6 and 17.2 acres of additional right-of-way will be required. It is anticipated that there will be one residential displacement if Alternative 3 is selected. No business displacements are required under any of the alternatives. There is an Environmental Justice community within the study area; however, there would be no direct or disproportionate impacts to the community. Efforts will continue, as the study progresses, to keep the community informed and current on the status of the study.

Eight public parks are located within the study area and include: Emerald Farm/Monarch Ridge Park, Golfview Park, Hillcrest Orchard Park, Hillcrest Park, David Lane Park, Hill Street Park, Overlook Park, and Ballenger Creek Park. Up to 1.1 acres of Ballenger Creek Park may be required with Alternative 3. Any use of a publicly-owned public park or recreational area, wildlife or waterfowl refuge, or a significant historic site will require development and evaluation of avoidance or minimization alternatives under Section 4(f) of the Department of Transportation Act of 1966.

Natural Environment

Study area streams are designated as Use III-P waters (Non-tidal Cold Water and Public Water Supplies) by the Maryland Department of Natural Resources (DNR). Stream impacts range from 50 to 415 feet depending on the alternative. A range of 0.42 to 0.51 acres of wetlands will also be required, depending on the alternative. A range of 0.23 to 1.1 acres of the 100-year floodplains associated with Ballenger Creek and its tributaries will be impacted. Additional floodplain studies will be completed to determine if there are adverse impacts to the beneficial values of the floodplains.

Coordination with the US Fish and Wildlife Service and DNR regarding state or federal-listed rare, threatened, or endangered plant or wildlife species indicates that the state-listed endangered loggerhead shrike is known to have occurred within the study area; however, its habitat will not be impacted by the project. DNR representatives also indicate that there is a rock outcrop habitat in the study area known to support three rare lichen species. A natural brown trout population has been documented in Ballenger Creek. DNR anticipates that the brown trout, and any other aquatic species that may occur within the study area, should be adequately protected by the in-stream work prohibition period and Best Management Practices typically used for protection of the stream resources. Sediment, erosion control and stormwater management plans will be submitted to Maryland Department of the Environment for review.

Cultural Resources

An assessment of archeological potential indicates that undisturbed portions of the study area are considered likely to have a high potential for prehistoric archeological resources. Archeological investigations will be completed, if required, when the areas of disturbance and right-of-way needs are identified. The State Highway Administration, in consultation with the Maryland Historical Trust (MHT) and other consulting parties, have identified four (4) significant historic standing structures in the study area that are listed on the National Register of Historic Places (NRHP) or are eligible (NRE) for listing. They are Prospect Hall, with an easement held by MHT (NRHP), George Widrick House (NRHP), Lily Homestead (NRE), and Maple Homestead (NRE). Up to 0.1 acre of Prospect Hall and 0.9 acre of Maple Homestead may be required, depending on the alternative. Avoidance and minimization alternatives will continue to be developed as the study progresses. Coordination with the MHT will continue throughout the study to determine the effects to significant historic standing structures and archeological resources.

Indirect and Cumulative Effects

Documentation will be developed on possible Indirect Cumulative Effects (ICE) of the project. Temporal and geographic boundaries for the ICE analysis have been determined.

The proposed temporal boundary for the ICE analysis extends from 1970 to the forecast year of 2030. Year 2000 is considered the "current year" for the analysis, due to that being the most recent year for which census data is available.

The proposed geographic boundary for the ICE analysis is a synthesis of watershed and census tract boundaries, with the project's watershed area being the basis for analyzing ICE effects on natural environmental resources, while the outer perimeter of three adjoining census tracts that encompass the project represents the boundary for analyzing socioeconomic and cultural ICE impacts. The watershed area is the Maryland Department of Natural Resources 12-digit watershed 021403020233, which is a subshed of the Lower Monocacy River. The three census tract boundaries, as delineated for the year 2000 decennial census, include tracts 7504, 7502.02, and 7510. The total area within the ICE geographic boundary is shown on mapping in **Appendix B**.

Noise and Air

Detailed air quality and noise analysis will be prepared during the next stage of the project planning study.

APPENDIX A:

ALTERNATIVES MAPPING

MD180/MD351 PLANNING STUDY

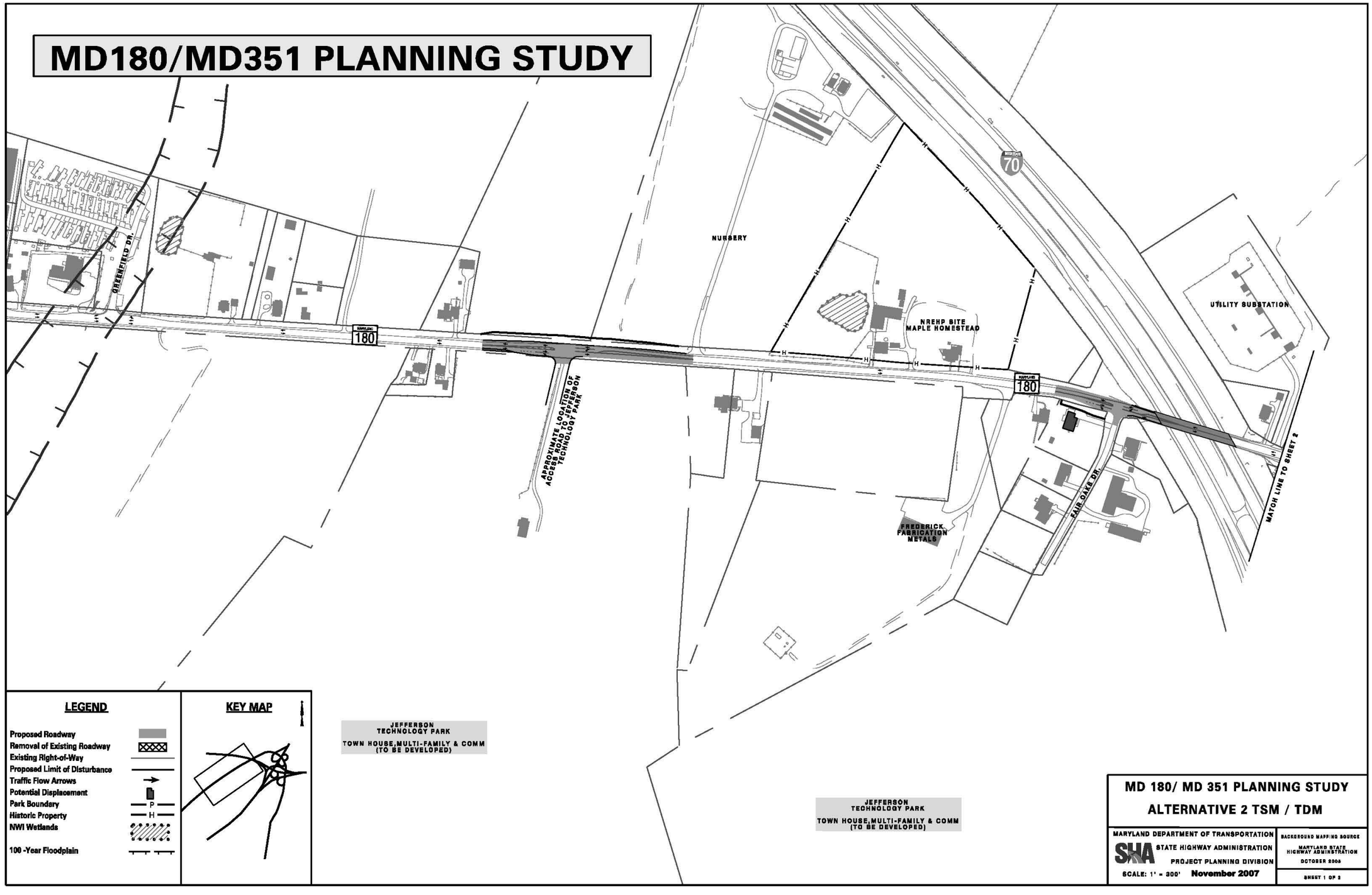
MD 180/ MD 351 PLANNING STUDY

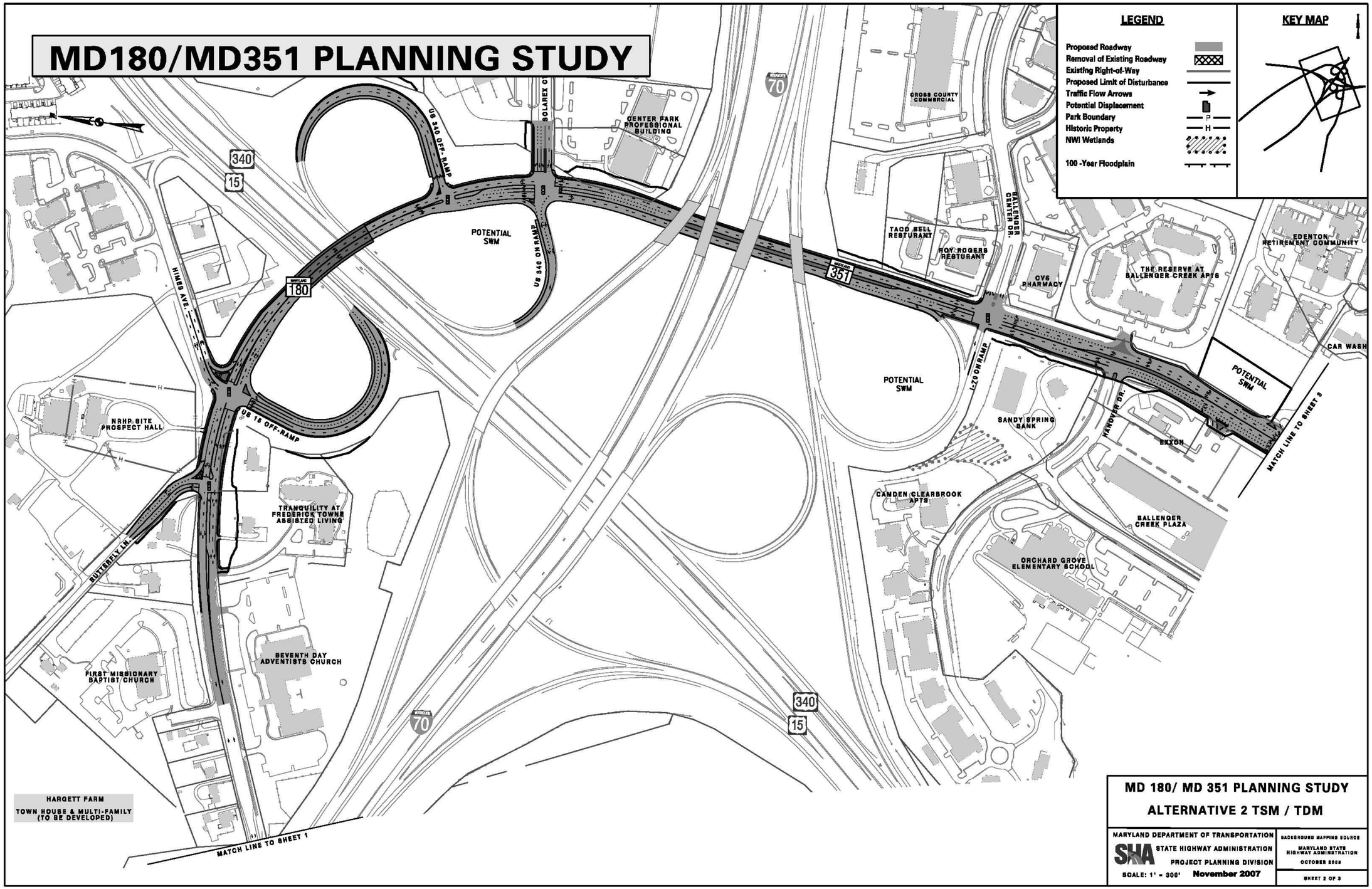
ALTERNATIVE 1 NO-BUILD

MARYLAND DEPARTMENT OF TRANSPORTATION
SHA STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' **November 2007**

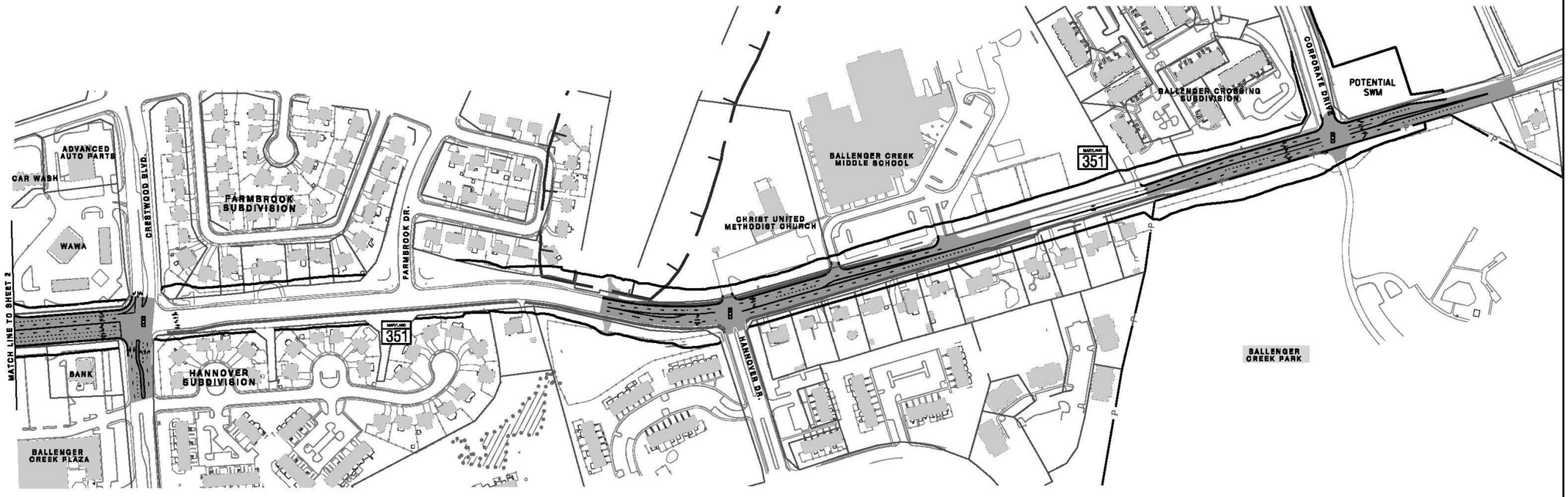
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006

SHEET 1 OF 1


MD180/MD351 PLANNING STUDY
GREENFIELD DR.
MARYLAND 180
NURSERY
NREHP SITE
MAPLE HOMESTEAD
INTERSTATE 70
UTILITY SUBSTATION
APPROXIMATE LOCATION OF ACCESS ROAD TO JEFFERSON TECHNOLOGY PARK
FAIR OAKS DR.
FREDERICK FABRICATION METALS
MATCH LINE TO SHEET 2
JEFFERSON TECHNOLOGY PARK
TOWN HOUSE,MULTI-FAMILY & COMM (TO BE DEVELOPED)
JEFFERSON TECHNOLOGY PARK
TOWN HOUSE,MULTI-FAMILY & COMM (TO BE DEVELOPED)
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 2 TSM / TDM
MARYLAND DEPARTMENT OF TRANSPORTATION
SHA STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2005
SHEET 1 OF 2


MD180/MD351 PLANNING STUDY
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
US 340 OFF- RAMP
SOLAREX CT.
CENTER PARK PROFESSIONAL BUILDING
CROSS COUNTY COMMERCIAL
BALLENGER CENTER DR.
TACO BELL RESTURANT
ROY ROGERS RESTURANT
CVS PHARMACY
THE RESERVE AT BALLENGER CREEK APTS
EDENTON RETIREMENT COMMUNITY
CAR WASH
POTENTIAL SWM
US 340 ON RAMP
HINES AVE.
NRHP-SITE PROSPECT HALL
US 15 OFF-RAMP
I-70 ON RAMP
SANDY SPRING BANK
HANOVER DR.
EXXON
MATCH LINE TO SHEET 3
TRANQUILITY AT FREDERICK TOWNE ASSISTED LIVING
CAMDEN CLEARBROOK APTS
BALLENGER CREEK PLAZA
ORCHARD GROVE ELEMENTARY SCHOOL
BUTTERFLY LN.
SEVENTH DAY ADVENTISTS CHURCH
FIRST MISSIONARY BAPTIST CHURCH
HARGETT FARM
TOWN HOUSE & MULTI-FAMILY (TO BE DEVELOPED)
MATCH LINE TO SHEET 1
340
15
70
180
351
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 2 TSM / TDM
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006
SHEET 2 OF 3

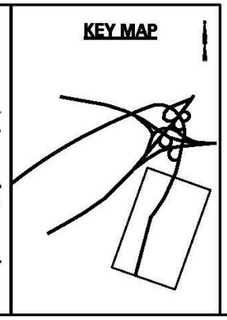
MD180/MD351 PLANNING STUDY



LEGEND

- Proposed Roadway
- Removal of Existing Roadway
- Existing Right-of-Way
- Proposed Limit of Disturbance
- Traffic Flow Arrows
- Potential Displacement
- Park Boundary (P)
- Historic Property (H)
- NWI Wetlands
- 100 -Year Floodplain

KEY MAP



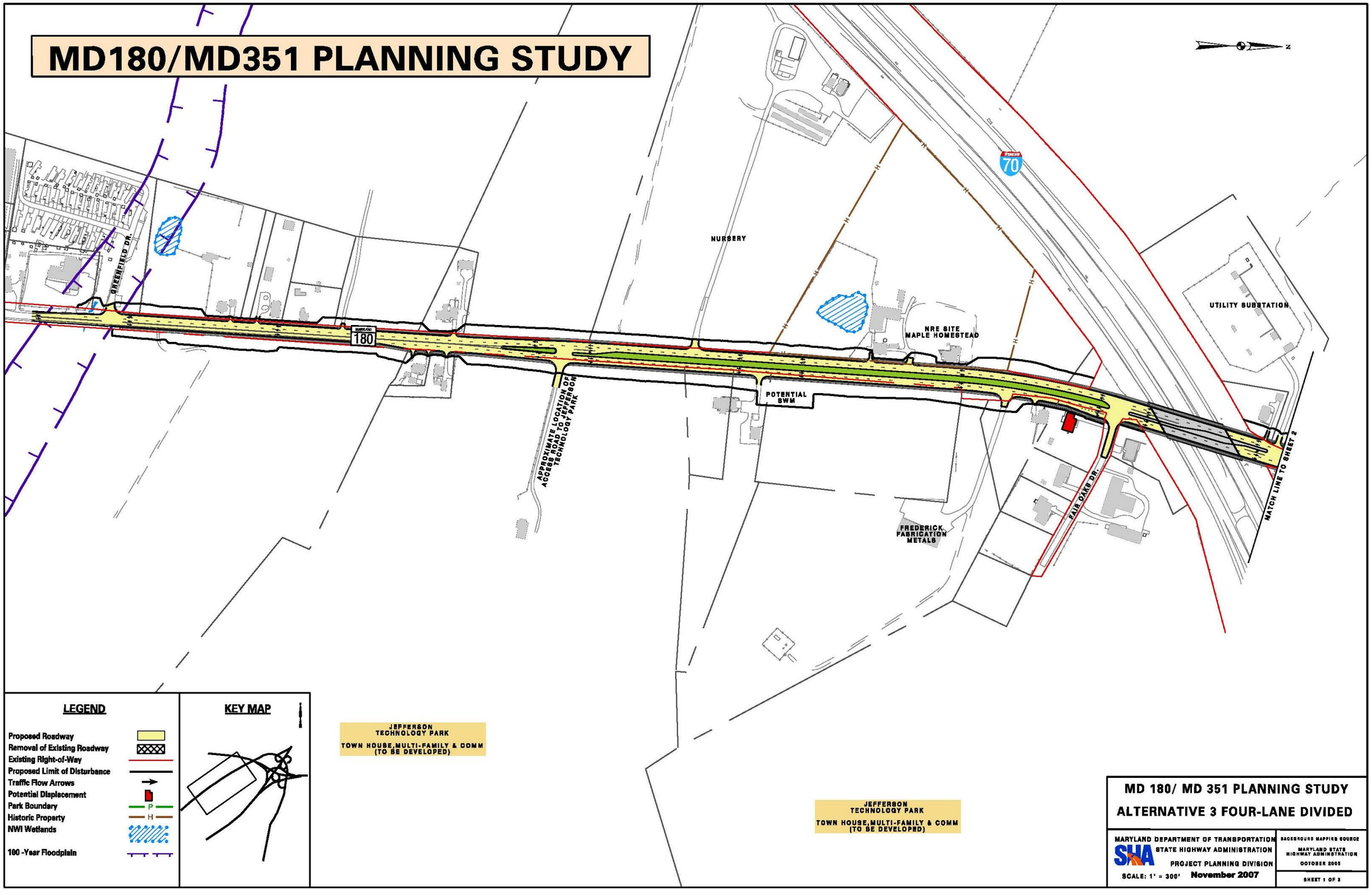
MD 180/ MD 351 PLANNING STUDY

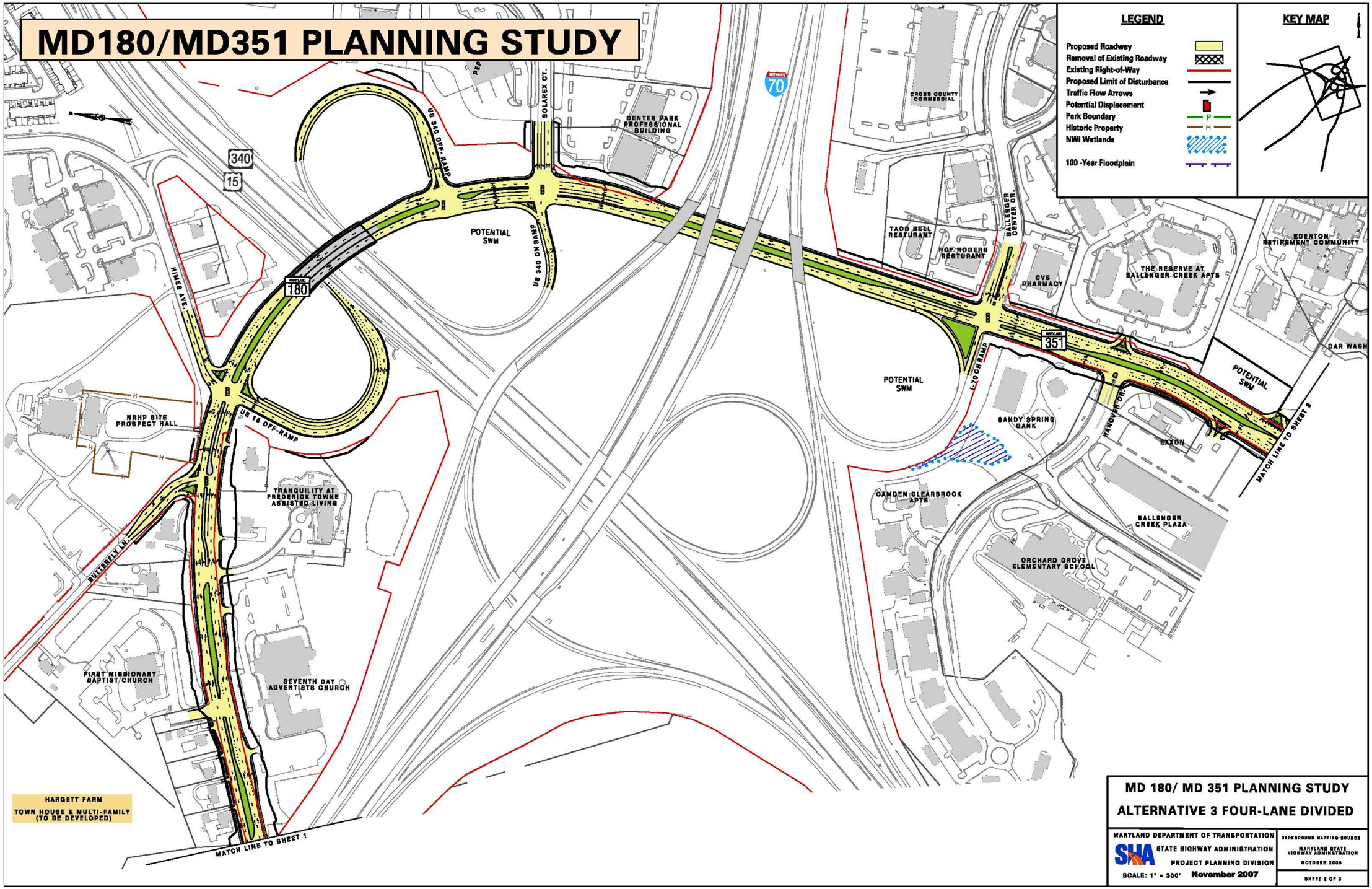
ALTERNATIVE 2 TSM / TDM

MARYLAND DEPARTMENT OF TRANSPORTATION
SHA STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' **November 2007**

BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006

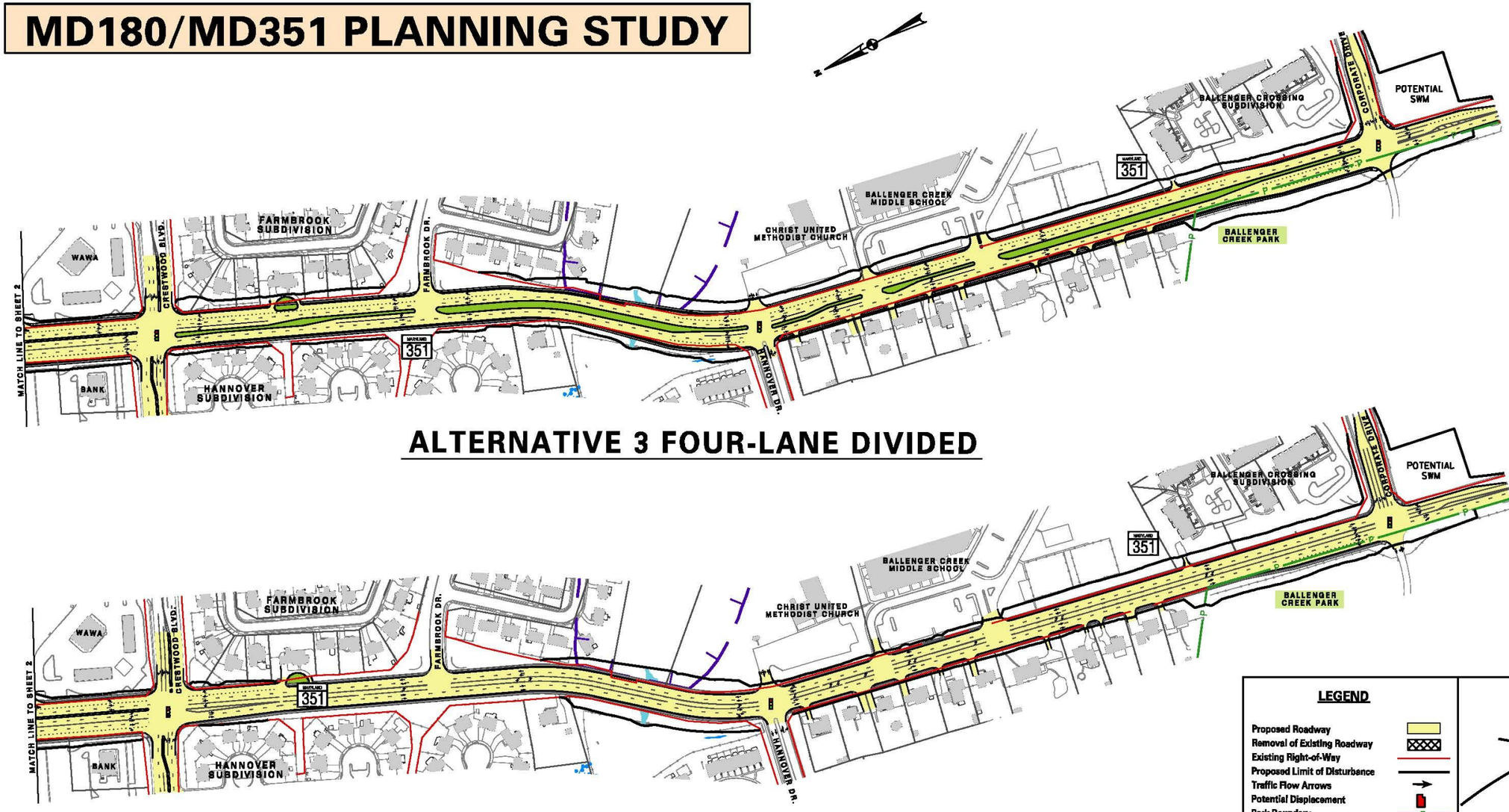
SHEET 2 OF 2


MD180/MD351 PLANNING STUDY
N
NURSERY
UTILITY SUBSTATION
NRE SITE
MAPLE HOMESTEAD
POTENTIAL
SWM
FREDERICK
FABRICATION
METALS
FAIR OAKS DR.
MATCH LINE TO SHEET 2
APPROXIMATE LOCATION OF ACCESS ROAD TO JEFFERSON TECHNOLOGY PARK
JEFFERSON
TECHNOLOGY PARK
TOWN HOUSE,MULTI-FAMILY & COMM
(TO BE DEVELOPED)
JEFFERSON
TECHNOLOGY PARK
TOWN HOUSE,MULTI-FAMILY & COMM
(TO BE DEVELOPED)
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 3 FOUR-LANE DIVIDED
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300'
November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2005
SHEET 1 OF 3


MD180/MD351 PLANNING STUDY
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
340
15
MARYLAND 180
MARYLAND 351
70
US 340 OFF-RAMP
US 340 ON RAMP
I-70 ON RAMP
SOLAREX CT.
HIMES AVE.
BUTTERFLY LN.
HANOVER DR.
BALLENGER CENTER DR.
POTENTIAL SWM
CENTER PARK PROFESSIONAL BUILDING
CROSS COUNTY COMMERCIAL
TACO BELL RESTURANT
ROY ROGERS RESTURANT
CVS PHARMACY
THE RESERVE AT BALLENGER CREEK APTS
EDENTON RETIREMENT COMMUNITY
CAR WASH
SANDY SPRING BANK
EXXON
CAMDEN CLEARBROOK APTS
BALLENGER CREEK PLAZA
ORCHARD GROVE ELEMENTARY SCHOOL
NRHP SITE PROSPECT HALL
US 15 OFF-RAMP
TRANQUILITY AT FREDERICK TOWNE ASSISTED LIVING
FIRST MISSIONARY BAPTIST CHURCH
SEVENTH DAY ADVENTISTS CHURCH
HARGETT FARM
TOWN HOUSE & MULTI-FAMILY (TO BE DEVELOPED)
MATCH LINE TO SHEET 1
MATCH LINE TO SHEET 3
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 3 FOUR-LANE DIVIDED
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2005
SHEET 2 OF 3

November 2007

MD180/MD351 PLANNING STUDY



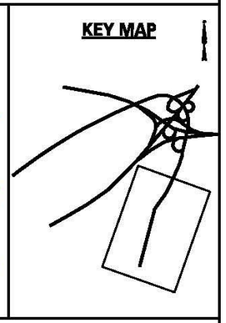
ALTERNATIVE 3 FOUR-LANE DIVIDED

MD 351 FIVE-LANE SECTION OPTION

LEGEND

- Proposed Roadway
- Removal of Existing Roadway
- Existing Right-of-Way
- Proposed Limit of Disturbance
- Traffic Flow Arrows
- Potential Displacement
- Park Boundary (P)
- Historic Property (H)
- NWI Wetlands
- 100 -Year Floodplain

KEY MAP

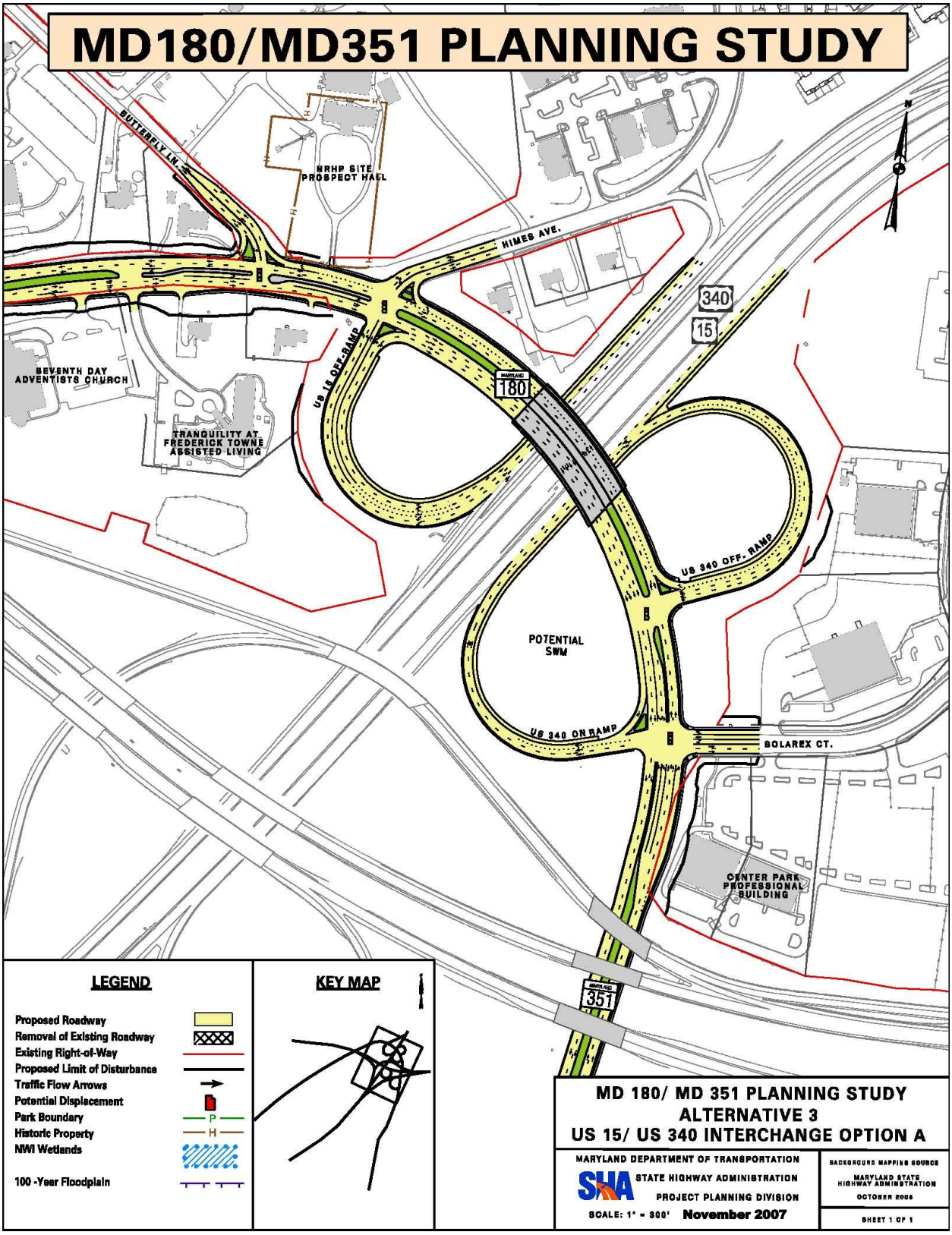


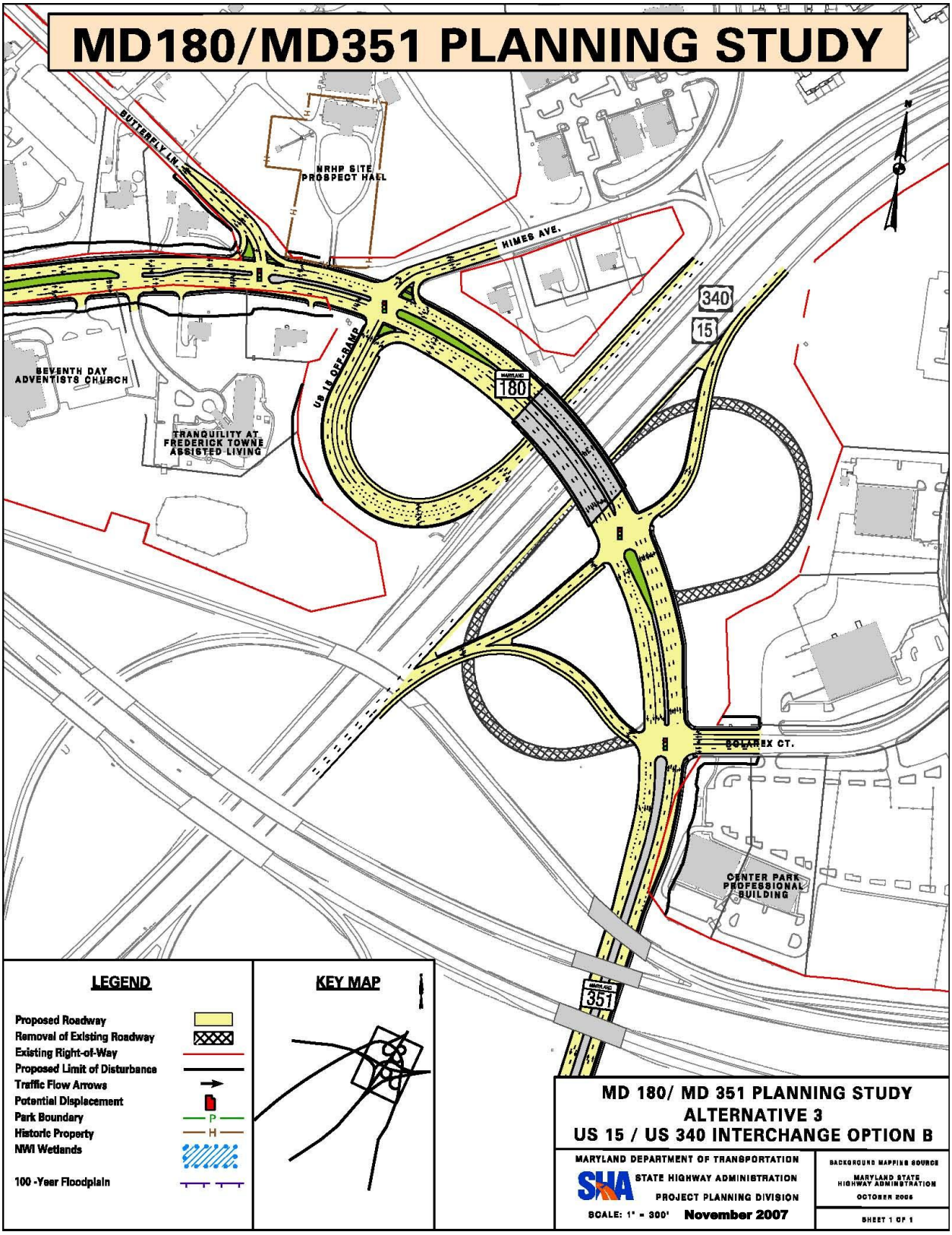
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 3 FOUR-LANE DIVIDED
and MD 351 FIVE-LANE SECTION OPTION

MARYLAND DEPARTMENT OF TRANSPORTATION
SHA STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' SEPTEMBER 2007

BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006

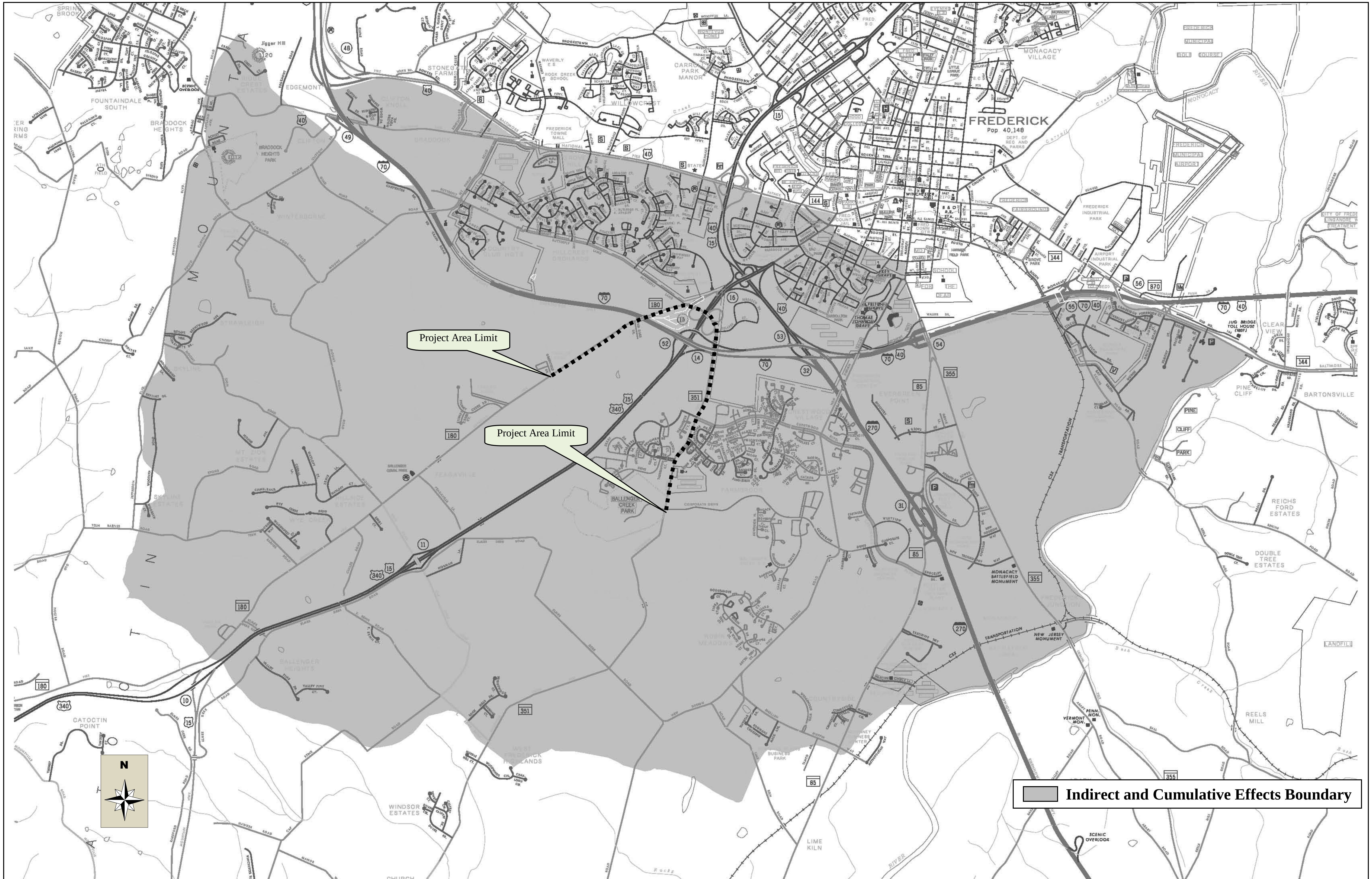
SHEET 3 OF 3


MD180/MD351 PLANNING STUDY
BUTTERFLY LN.
NRHP SITE PROSPECT HALL
HIMES AVE.
340
15
SEVENTH DAY ADVENTISTS CHURCH
US 15 OFF-RAMP
MARYLAND 180
TRANQUILITY AT FREDERICK TOWNE ASSISTED LIVING
US 340 OFF. RAMP
POTENTIAL SWM
US 340 ON RAMP
SOLAREX CT.
CENTER PARK PROFESSIONAL BUILDING
MARYLAND 351
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 3
US 15/ US 340 INTERCHANGE OPTION A
MARYLAND DEPARTMENT OF TRANSPORTATION
SHA STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300' November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006
SHEET 1 OF 1


MD180/MD351 PLANNING STUDY
BUTTERFLY LN.
NRHP SITE PROSPECT HALL
HIMES AVE.
340
15
SEVENTH DAY ADVENTISTS CHURCH
US 15 OFF-RAMP
MARYLAND 180
TRANQUILITY AT FREDERICK TOWNE ASSISTED LIVING
SOLAREX CT.
CENTER PARK PROFESSIONAL BUILDING
MARYLAND 351
LEGEND
Proposed Roadway
Removal of Existing Roadway
Existing Right-of-Way
Proposed Limit of Disturbance
Traffic Flow Arrows
Potential Displacement
Park Boundary
Historic Property
NWI Wetlands
100 -Year Floodplain
KEY MAP
MD 180/ MD 351 PLANNING STUDY
ALTERNATIVE 3
US 15 / US 340 INTERCHANGE OPTION B
MARYLAND DEPARTMENT OF TRANSPORTATION
STATE HIGHWAY ADMINISTRATION
PROJECT PLANNING DIVISION
SCALE: 1" = 300'
November 2007
BACKGROUND MAPPING SOURCE
MARYLAND STATE HIGHWAY ADMINISTRATION
OCTOBER 2006
SHEET 1 OF 1

APPENDIX B

Indirect and Cumulative Effects Boundary Map


Project Area Limit
Project Area Limit
Indirect and Cumulative Effects Boundary
N
FREDERICK
Pop 40,148
FOUNTAINDALE SOUTH
BRADDOCK HEIGHTS
EDGEMONT
WINTERBORNE
MONACACY VILLAGE
CARROLL PARK MANOR
BARTONSVILLE
REICHS FORD ESTATES
DOUBLE TREE ESTATES
REELS MILL
CATOCTIN POINT
WINDSOR ESTATES
LIME KILN
LANDFILL